Normal Levels of Research Activity at the National Tritium Labelling Facility (NTLF)

Environmental Sampling Project Task Force
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Philip G. Williams

National Tritium Labelling Facility (NTLF)
Physical Biosciences Division
E.O. Lawrence Berkeley National Laboratory

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What is the Question ??

- What will be the level of research activity at the NTLF over the next year ?
- Are the Superfund-related measurements valid ?
- What is the radiological impact on the public from NTLF operations ?

NTLF Mission

National Institutes of Health (NIH):

National Center for Research Resources (NCRR):

Biomedical Technology Area (BTA) Goals:

- Technological Research & Development
- Collaborative Research
- User Service
- Training
- Dissemination of Information

NTLF Staff

Name	Role	Start at NTLF	^{3}H Experience
David E. Wemmer B.S., Ph.D.	Principal Investigator	8/89	11
Philip G. Williams B.Sc., Ph.D.	**Co-Principal Investigator Facility Manager**	**5/86 (14)**	**19**
Hiromi Morimoto B.S.	**User Supervisor**	**8/82 (18)**	**18**
Manouchehr Saljoughian Pharm.D., Ph.D.	**Staff Scientist**	**3/86 (14)**	**19**
Chit Than B.Sc., M.Sc., Ph.D.	**Staff Scientist**	**10/93 (7)**	**13**
Akhilesh N. Trivedi M.Sc., Ph.D.	Health Physicist	4/00	12

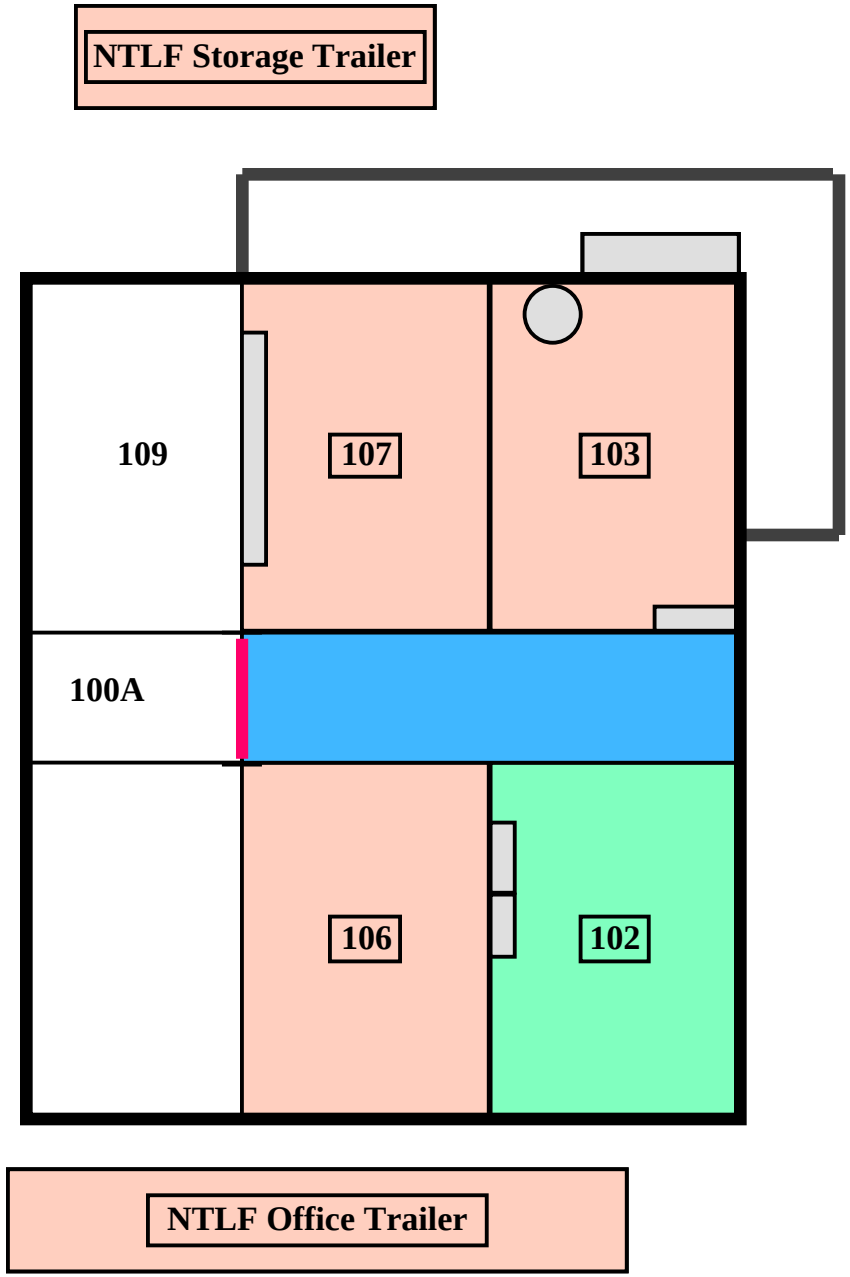

NTLF Storage Trailer
109
107
103
100A
106
102
NTLF Office Trailer

Photo of B75 Room 103

Tritium_Lab.GIF

http://www.lbl.gov/LBL-Programs/NTLF/103.html

Photo of Tritium U-Bed

Photograph of Tritium U-Bed

http://www.lbl.gov/LBL-Programs/NTLF/Ubed.html

Photo of Spare Tritium U-Bed

Spare U-Bed

XBC 9010-08545

Peer Review and Funding

NIH Review of the NTLF Research Program

- Annual progress reports each June 1 (100 pager)
- Last Competitive review: 19 March 1999 (twelve scientists)
- Priority Score: 115 (top few % of all NIH grants)

******** compare ********

- Previous competitive review: 18 November 1993 (nine visiting scientists)
- Priority Score: 133; Percentile: 6.6% (against "total Division of Research Grants" base)

Review of the NTLF Research and Safety Programs

- Scientific Advisory Committee (six scientists, February 1998)
- Technical and Safety Advisory Committee (seven scientists, April 2000)

What Types of Activities Can Contribute to Tritium Emissions ?

- Tritium labelling reactions (scale, % tritium, chemistry ...)
- Recovery and isolation of products
- Characterization and purification of products
- Analysis of products
- Measurement of inventory
- Repair and maintenance of equipment
- Waste storage, packaging, and repackaging
- Waste characterization
- Mixed waste analysis, oxidation and recovery

Review of Radiological Monitoring at LBNL

(Preliminary Technical Report, 6/30/00)
Bernd Franke and Anthony Greenhouse

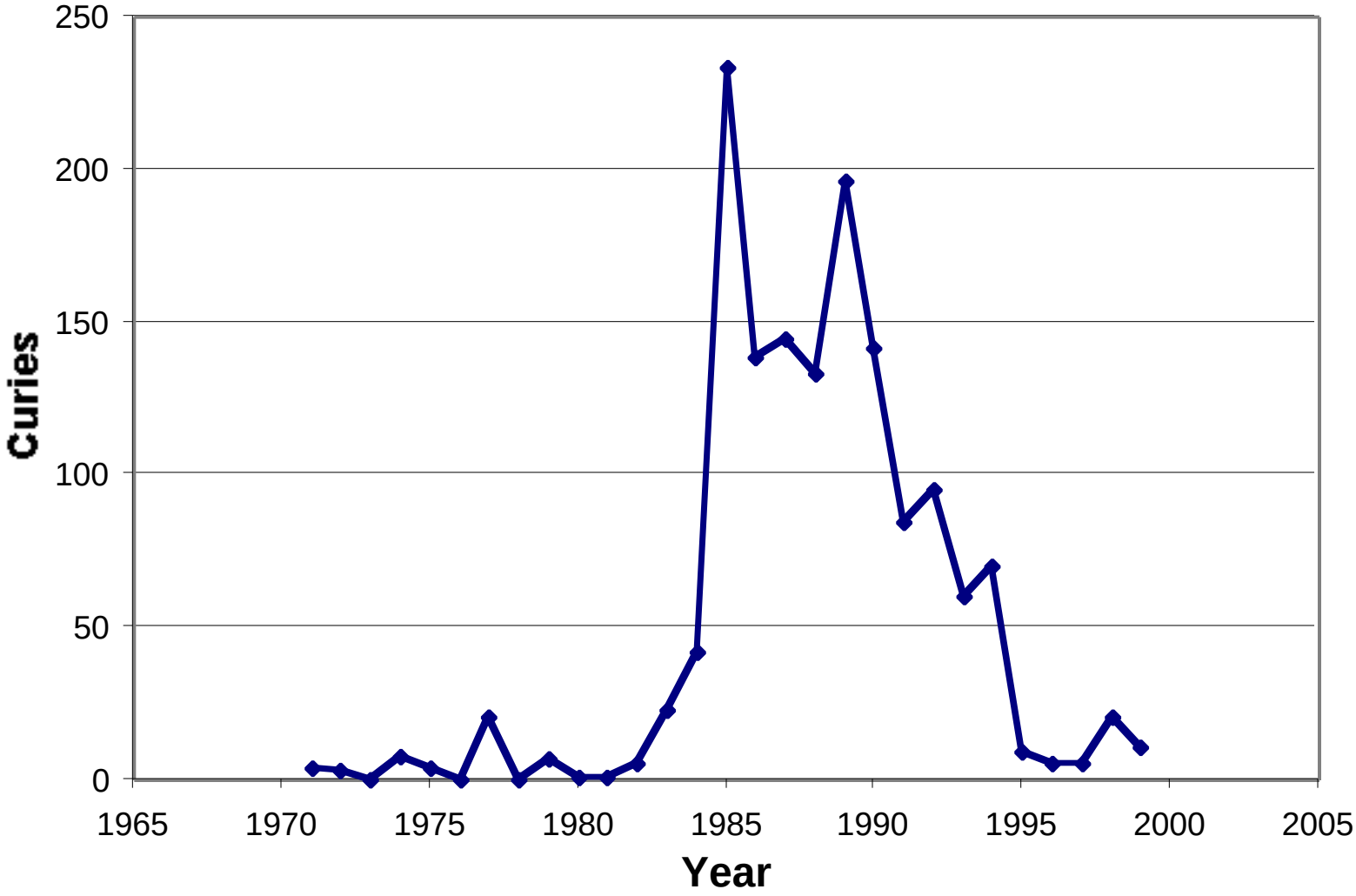
NMMSS inventory data and airborne emissions ....

"There is no clear correlation between the two numbers. During the 1990s, the reported releases of tritium decreased even though the reported inventory did not change much." p.6 and Figure 2 on p.7

Tritium shipments ....

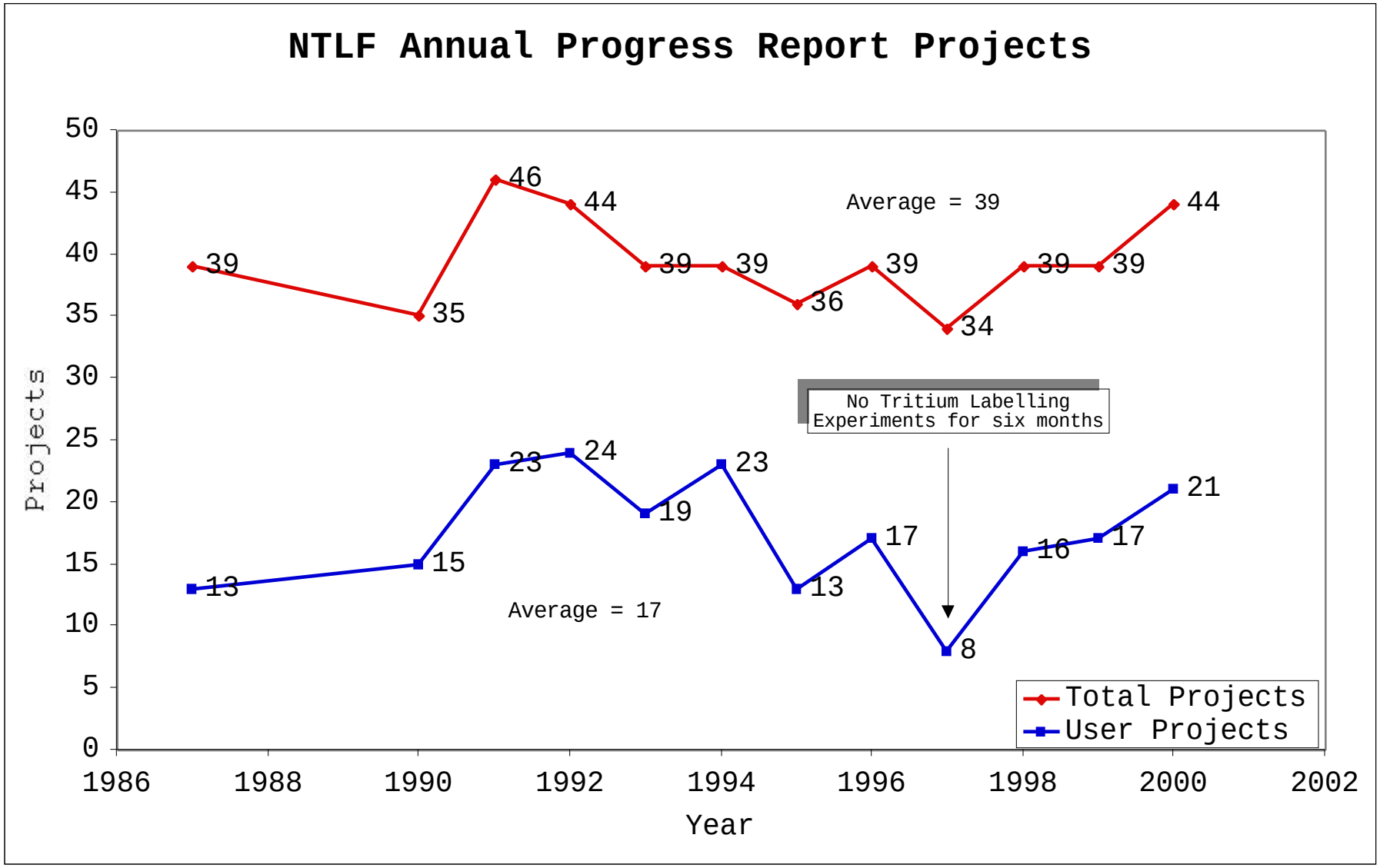
"However, neither tritium shipments nor the tritium inventory appear to be a good indicator for the likelihood of potential releases."

Tritiated Product Shipments



Indicators of Research Activity ?

- Number of tritiation reactions done
- Amount of tritium used (tritium inventory)
- Amount of tritiated product shipped
- Number of User projects done
- Number of projects reported to NCRR
-
-


NTLF Annual Progress Report Projects
Projects
Year
Average = 39
Average = 17
No Tritium Labelling
Experiments for six months
Total Projects
User Projects
50
45
40
35
30
25
20
15
10
5
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
39
35
46
44
39
39
36
39
34
39
39
44
13
15
23
24
19
23
13
17
8
16
17
21

Users, Collaborators, Trainees

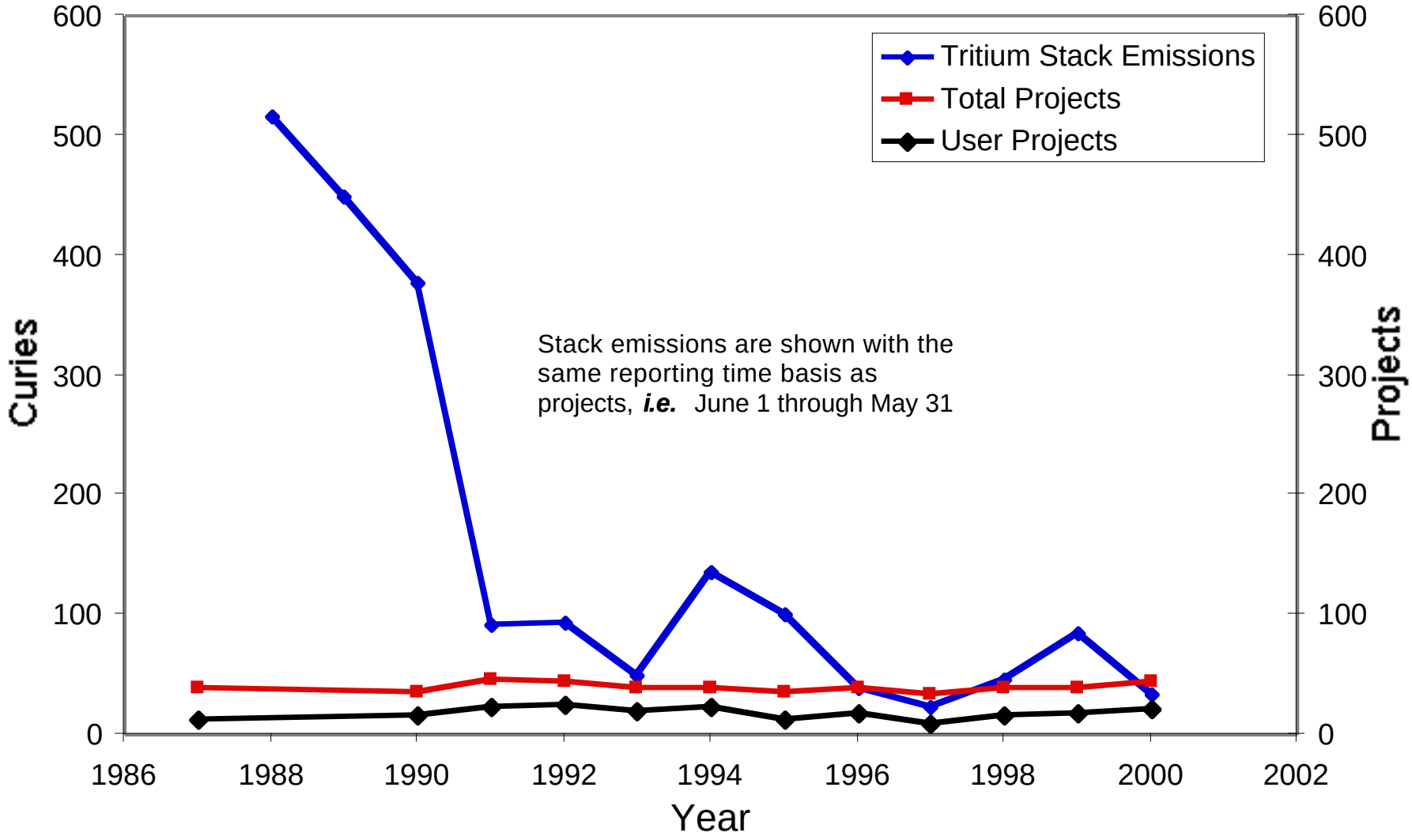
From 6/1/99 - 5/31/00 (APR 16S1)

University of Kentucky	KY	USA
Novartis		Switzerland
Multiple Peptide Systems	CA	USA
Roskilde University		Denmark
Trace Photonics, Inc.	IL	USA
University of California, Berkeley	CA	USA
University of Illinois	IL	USA
Bristol Myers Squib	CT	USA
Vitrax, Inc.	CA	USA
Roche Biosciences	CA	USA
American Radiolabelled Compounds	MO	USA
Rutgers	NJ	USA
Pathogenesis	WA	USA
Albert Einstein College of Medicine	NY	USA
University of Wisconsin-Madison	WI	USA
Wyeth-Ayerst	NY	USA
University of California, Riverside	CA	USA
Chiron Corporation	CA	USA
UMDNJ-R.W. Johnson Medical School	NJ	USA
SRI International	CA	USA

(continued)

University of California, San Francisco	CA	USA
University of Washington	WA	USA
Princeton University	NJ	USA
University of Toronto	Ontario	Canada
The Salk Institute	CA	USA
University of Arizona	AZ	USA
Eli Lilly and Company	IN	USA
Pharmacia and Upjohn		Switzerland

Number of Projects compared to Stack Emissions



What Measures Have Contributed To Reduced Tritium Emissions ?

- Tritium recovery from reactions as tritium gas
- Prompt trapping, packaging and storage of waste
- Broader choice of labelling chemistry, better chemical tools
- Later stage labelling (smaller scale)
- More purification of product, no storage of crude products
- Improved tritiation line and emissions control hardware
- More and better process monitoring
- Review of safety peers (*e.g.* EH&S, TSAC)

Summary

- The level of Research Activity at the NTLF over the next year will be near the average for the past ten years (about 40 projects)
- Decreased emissions and decreased tritium use are due to improved operations
- The radiological impact on the public from NTLF operations is well-characterized, and is a small percentage of the Regulatory standard

no trabajo, no dinero .... no work, no money

Questions & Comments

Co-Principal Investigator and Facility Manager for the NTLF

Dr. Philip G. Williams
National Tritium Labelling Facility
Mail Stop 75-123
E.O. Lawrence Berkeley National Laboratory
One Cyclotron Road
Berkeley, CA 94720, U.S.A.

Voice: 510/486-7336
510/486-4373

Fax: 510/486-4877

E-Mail: PGWilliams@LBL.GOV

WWW: http://www.lbl.gov/LBL-Programs/NTLF
WWW: http://www.lbl.gov/LBL-Programs/tritium

Adjunct Associate Professor
Department of Pharmaceutical Chemistry
School of Pharmacy
University of California
San Francisco, CA 94143-0446, U.S.A.

Annual Tritium Doses from the NTLF since 1969

Doses are based on the maximum potential offsite exposure